



## Examining The Effect of Interactive Feedback Procedure on the Individualized Education Program (IEP) Goals

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### ABSTRACT

An Individualized Education Program (IEP) is essential for both assisting students to meet their needs and enabling professionals to evaluate the students' progress. The purpose of this study was to enhance the teacher candidates' performance of writing IEP goals and objectives by using interactive feedback procedures. Seventy-three pre-service teachers in elementary education program participated in the study. They were required to write IEP goals according to case scenarios at three different times. A two-factor analysis of variance with repeated measures was completed for the dependent variables. The results of this study indicate that there are statistically significant differences between the means at each measurement time for pretest-posttest-maintenance scores. Implementation of interactive feedback procedures is found to be successful at improving the IEP goals and objectives writing skills of the teacher candidates. Limitations and implications for practitioners are presented.

**Keywords:** goal writing, pre-service teacher education, individualized education program (IEP), interactive feedback, students with special needs

## Etkileşimli Geribildirim Prosedürlerinin Bireyselleştirilmiş Eğitim Programı (BEP) Amaçları Üzerindeki Etkisinin İncelenmesi

### Öz

Bireyselleştirilmiş Eğitim Programı (BEP), hem öğrencilerin ihtiyaçlarına cevap vermek hem de onların ilerlemelerini değerlendirebilmek için kritik öneme sahiptir. Bu çalışmanın amacı, öğretmen adaylarının etkileşimli geri bildirim prosedürlerini kullanarak BEP amaç ve hedeflerini yazma performanslarını arttırmaktır. Araştırmaya sınıf öğretmenliği programında öğrenim gören 73 öğretmen adayı katılmıştır. Öğretmen adaylarından, kendilerine verilen olay senaryolarına üç farklı zamanda BEP amaçları yazmaları istendi. Bu amaçlar puanlandıktan sonra, tekrarlı ölçümlerde iki faktörlü varyans analizi uygulandı. Çalışmanın sonuçları, ön test-son test- izleme puanları için ortalamalar arasında istatistiksel olarak anlamlı farklılıklar olduğunu göstermektedir. Buna göre, etkileşimli geribildirim prosedürleri uygulaması öğretmen adaylarının BEP amaç ve hedeflerini yazma becerilerini geliştirmede başarılı bulunmuştur. Araştırmacılar, bulguları güncel alan yazın ile tartışmış ve uygulamacılar için çeşitli öneriler sunmuşlardır.

**Anahtar kelimeler:** amaç yazma, öğretmen eğitimi, bireyselleştirilmiş eğitim programı (BEP), etkileşimli geribildirim, özel gereksinimli öğrenciler

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## 1 | INTRODUCTION

Educational mandates and legislation concerning students with special needs around the world aim to meet their needs related to education, employment, and independent living. Developing a well-written Individualized Education Program (IEP) is one of the expected steps to meet the needs of each student with a disability in public school settings (Caruana, 2015). The purpose of developing an IEP is to create an educational map that includes goals, objectives, and ways of how special education services enhance educational standards for a student (Thompson et al., 2001). The IEP goals should not only assist students with disabilities to meet their educational and functional needs, but they also enable stakeholders to monitor and evaluate potential progress throughout the timeframe (Boavida et al., 2010; Ruble et al., 2010; Sanches-Ferreira et al., 2013). Moreover, the IEP goals are essential for students with disabilities to support their learning process and growth (Räty et al., 2018) with a focus on their strengths in order to assure their progress in all academic, social, and life-related skills (Caruana, 2015). Despite the legally defined content, known significance, and decades of development, many IEP goals, and objectives are still poorly written (Boavida et al., 2010; Pretti-Frontczak & Bricker, 2000; Rakap, 2015; Sanches-Ferreira et al., 2013). Researchers who conducted studies related to the quality of IEP goals and objectives reported that the goals and objectives had missing required components, deficiencies in the components, lacked sufficient information about addressed skills, and/or were simply not functional (Boavida et al., 2014; Lynch & Beare, 1990; Pretti-Frontczak & Bricker, 2000; Ruble et al., 2010). Well-written IEP goals need to focus on a student's needs and strengths (IDEA, 2004) and must contain clear and specific objectives (Jung, 2007) that are functional (Pretti-Frontczak & Bricker, 2000), measurable (Jung, 2007; Lignugaris-Kraft et al., 2001; Ruble et al., 2010), and observable (Ruble et al., 2010; Wolery et al., 1988). Historically, a goal or an objective should include four essential components including the student's name, condition, behavior, and performance criteria (Alberto & Troutman, 2013; Lignugaris-Kraft et al., 2001; Mager, 1962; Wolery et al., 1988).

*Student's name* should be included in goals and short-term objectives as the learner's name instead of referring to him or her as "the student" or "the child". As an essential part of individualization, it is a requirement to include "who" is performing the behavior. The teacher or the instructor cannot be the subject of a written goal (Kargin, 2007) since the subject is the learner.

*Condition* is also a crucial component for writing quality IEP goals. It has one requisite part, which includes a clear description of under what conditions a certain behavior will occur in order to accept that the behavior is learned by the student (Lignugaris-Kraft et al., 2001; More & Hart-Barnett, 2014). In addition, there are two optional parts: accommodation or needed assistance and the setting for the evaluation (Lignugaris-Kraft et al., 2001). A goal or an objective might include necessary accommodations, prompts, and/or the assessment environment to specify the student's demonstration of competence.

Furthermore, *behavior* is another essential component. Every goal and objective must include a clearly defined, observable, and measurable behavior. Therefore, what a student will actually do can be seen, heard, and/or counted (Sanches-Ferreira et al., 2013). The teacher or the instructor should be able to describe behavior as that which can be easily agreed upon by every observer. When goals and objectives include non-observable behaviors, such as comprehending, knowing, or understanding, it becomes impossible for teachers to count, measure, and/or collect data (Boavida et al., 2010; Pretti-Frontczak & Bricker, 2000).

Last, *criteria* should be considered for writing the IEP goals and/or short-term objectives since they need to include a performance criterion for teachers to evaluate a student's accomplishment of the targeted behavior (Jung et al., 2003). A performance criterion has three potential components including the mastery level, the number of times the learner will perform the behavior to reach the mastery level, and the schedule to evaluate student mastery (Lignugaris-Kraft et al., 2001). Therefore, including the criteria in the goal statement is essential to determine how accurately the learner demonstrates the behavior in order to state that the behavior has been acquired.

In addition to these four components to write a technically high-quality IEP goal, the functionality of the goal has also been found to be essential in the previous research related to writing quality IEP goals (Alberto & Troutman, 2013; Bateman & Linden, 2006; Boavida et al., 2010). *Functionality* is defined as a concept that values the immediacy and future utility of a targeted goal (Karal & Wolfe, 2020; Lucas et al., 2014; Pretti-Frontczak & Bricker, 2000). Along with the usefulness, a goal and/or an objective should be socially valid, age-appropriate, and positively worded (Ferguson, 2011; Lucas et al., 2014). Functionality should be seen as the fifth component since it is likely to be necessary for a student’s success (Boavida et al., 2010), and it allows students to be independent in everyday functioning (Pretti-Frontczak & Bricker, 2000). The non-functional goals do not generate a needed skill in either current or future environments and waste instructional time (Karal & Wolfe, 2020). Table 1 provides examples and non-examples for each component of an IEP goal.

Table 1

*Examples and Non-examples for Each Component of an IEP Goal*

Components	Example	Non-Example
Condition	Given a worksheet with 10 subtraction problems without regrouping,	Given 10 seconds,
Student’s name	Mary	The student
Behavior	will write correct answers	will recall the acreage of her country
Criteria	90% accuracy on 3 consecutive weekly exercises.	60% of the time.
Functionality	Functional	Non-functional
Goal	Given a worksheet with 10 subtraction problems without regrouping, Mary will write correct answers with 90% accuracy on 3 consecutive weekly exercises.	Given 10 seconds, the student will recall the acreage of her country 60% of the time.

### ENHANCING THE QUALITY OF IEP GOALS

IDEA requires an IEP team including at least one regular education and one special education teacher as well as the child with a disability, a family member, a representative of the local education agency, and other individuals who have knowledge or special expertise regarding the child. Because teachers provide information about the present level of performance and potential of the child, they have critical roles as both writers and implementers of the IEP. Thus, it is crucial for teachers to have a deep understanding of how to manage IEP goals and objectives. Furthermore, the increasing need of implementing inclusive practices in diverse classrooms and its influences on teacher education programs require educators to enhance the quality and quantity of the mandatory courses related to special education (Obradović et al., 2011).

One of the objectives of these mandatory and/or elective courses is to enable teacher candidates to have insight into the field of special education including how to write high-quality goals and objectives. In Turkey, there is a limited number of studies related to the IEP development process. In the study conducted by Rakap (2015), written IEPs were investigated and the overall quality of goals and objectives was found to be generally poor. It was also found that IEP goals and objectives were not written in detail and teachers lack knowledge in the development of IEPs including the performance of the individuals, the criteria, and the description of problem behavior (Akarsu & Atbasi, 2021). In the studies conducted by Tike-Bafra and Kargın (2009) and Ozturk ve Eratay (2010), teachers stated that developing IEPs requires extra workload and implementing IEPs is difficult in crowded classrooms. When the IEP goals and objectives lack the quality of being functional and age-appropriate, most teachers lower their expectations toward students with disabilities (Ruble et al., 2010). Learning about and practicing writing adequate goals during pre-service education is found to be effective as well as it is beneficial for the in-service training opportunities (Davis & Bates, 1997) to increase the achievement of students from various backgrounds. Therefore, it is necessary to improve pre-service and in-service teachers’ writing skills.

### FEEDBACK

Feedback is one of the most effective practices that help individuals to build and improve their skills and knowledge regardless of the educational stage (McLean et al., 2014; Sadler, 2010). Feedback is defined as the

communication opportunity after the instruction between the teacher and students to improve their learning and performance (Hattie & Timperley, 2007; Pereira et al., 2016; Poulos & Mahony, 2008; Shute, 2008). Therefore, even though feedback is a consequence of performance (Hattie & Timperley, 2007), it is a process more than a one-way information transfer and a product (Beaumont et al., 2011). Many studies have found feedback to be one of the key elements that have the strongest influence on the teaching quality to support individuals' learning action/task and to help overcome their mistakes effectively as well as to improve their knowledge on the subject matter (Agricola et al., 2020; Carless, 2006; Havnes et al., 2012; Pereira et al., 2016).

Despite the extensive body of literature about the benefits and advantages of feedback, it is not always effective (Price et al., 2008) or unambiguously positive (Van der Schaaf et al., 2013). Students may not understand the given feedback (Hyatt, 2005), may not be able to interpret what is written (Higgins et al., 2001), might be only interested in a grade (Stothart, 2008), or might perceive it as though they are being directed toward the answer of the assignment or the exam (McLean et al., 2014). These issues might be related to the students' previous experiences with feedback (Blair & McGinty, 2013; Robinson et al., 2013) or the content of the feedback (Higgins et al., 2001). When feedback lacks clarity about the expectations of a teacher (Bowl, 2003) and creates ambiguity (Price et al., 2010), it leads to frustration and disengagement in students concerning the proceeding and subsequent learning (Perreira et al., 2016; Poulos & Mahony, 2008). Many of these problems occurred when providing just a written comment as feedback (Agricola et al., 2020; Carless et al., 2011; Havnes et al., 2012). Verbal feedback along with written feedback appears to be a solution to overcome these problems associated with one-way, inadequate feedback (Agricola et al., 2020; Blair & McGinty, 2013). Feedback conversations between the learner and the instructor will have an impact on the efficiency of the process because learners do not only acquire written comments but also have opportunities to exchange information about their performance (Nicol & McFarlane-Dick, 2006; Sadler, 2010). This interactive process where interpretations and expectations are discussed develops the repeated feedback cycles (Beaumont et al., 2011; Carless et al., 2011).

Considering the efficiency of feedback on students' performance, the purpose of the current study was to enhance the teacher candidates' performance of writing IEP goals and objectives by using interactive feedback procedures. Both written and verbal feedback was used to enhance not only the overall quality of the IEP goal writing but also the quality of each component. The study was to serve as an initial analysis of interactive feedback effectiveness in improving the IEP goal writing quality.

## 2 | METHOD

### PARTICIPANTS AND SAMPLING

Convenience sampling is defined as selecting participants from a group of individuals who conveniently are available for the study (Fraenkel et al., 2011). Therefore, convenience sampling was employed for this investigation. Before we started to collect the data, the study was approved by the ethical board of the institute. The participants were enrolled in one of the two sections of a course titled *Introduction to Special Education* taught by one of the researchers of this study. One of the main objectives of this course is to teach pre-service teachers how to write IEP goals and objectives. They also learn how to make necessary accommodations for all students in inclusive classrooms.

Seventy-three pre-service teachers who were in their senior year of the elementary education program voluntarily participated in the study after they received a brief explanation regarding the study's purpose and procedures. Thirty-six of the participants were in section one and 37 were in section two. For the purpose of this study, both sections were combined for the analysis since they received the same instruction from the same researcher as their instructor. The ages of all participants ranged from 22 to 23. Fifty-one percent of the participants were female, and 49% of the participants were male. The majority of the participants were Turkish (96%) while only (4%) of the participants indicated other ethnicities. Further demographics showed that all the participants had neither written an IEP goal nor had they had any teaching experience with students with disabilities

### PROCEDURES

The implementation of this study was carried out for nine weeks of the course. The procedures had three components: IEP training, case scenarios, and interactive feedback.

### *IEP TRAINING*

The pre-service teachers received a two-hour IEP training session conducted by the researcher of this study. The training involved a one-hour PowerPoint lecture on how to write the present level of performance, long-term goals, and short-term goals and objectives. The second half of the training included various activities that helped participants build upon what was learned and provided an opportunity to practice their IEP goal writing skills. The activities included dividing up the components of a given goal, correcting an inaccurately written goal, and finding the missing component of a goal. The activities also consisted of writing IEP goals based on a case scenario.

### *CASE SCENARIO*

Case scenarios are used to enhance learning in special education research (Karal & Wolfe, 2020; McLinden et al., 2007, 2010). There were three different case scenarios describing a hypothetical student's characteristics besides the case scenario used for the class activity in the training. They presented information about elementary students who were placed in an inclusive education setting. Each case scenario involved information about the student's diagnosis, the current level of academic performance, and his or her strengths and weaknesses in both social skills and daily living skills. Once the case scenarios were prepared, two assistant professors in the field of special education reviewed and approved the appropriateness of the scenarios. The special needs category of case scenarios was selected among the ones who are more likely to be eligible for inclusive education such as students with a learning disability, a mild intellectual disability, and the gifted (see Appendix).

### *INTERACTIVE FEEDBACK*

The interactive feedback procedure was included in the content to ensure that the pre-service teachers receive adequate support to increase their knowledge and performance on writing IEP goals and objectives. This procedure included written and verbal feedback on the goals and objectives that they wrote based on the case scenarios provided by the researcher. The participants received feedback for their first and second goal-writing tasks that were equal to a total of two hours of interactive feedback. Detailed written feedback was provided to the participants regarding the IEP goal writing. The written feedback contained comments, corrections, examples, and non-examples of an IEP goal. After the participants received the written feedback, the researcher provided one hour of verbal feedback to explain the points that the participants need to improve. The verbal feedback included a PowerPoint presentation on the mistakes and inaccuracies when writing an IEP goal. In the remaining time, any questions of the participants about IEP goal writing were answered. The instructor provided opportunities to the pre-service teachers to clarify the issues of goal writing and let them discuss their performance on their goal-writing task in small groups.

### *INSTRUMENTATION*

The participants completed the IEP goal writing at three different times: after a week of the training (pretest), after a week of receiving the first feedback (posttest), and after four weeks of receiving the second feedback (maintenance). The pre-service teachers were asked to read the instruction in the case scenario and to write the IEP goals and objectives based on the common core standards by considering the characteristics of the student. The appendix includes an example of a case scenario, the common core standards, and the feedback table. The common core standards were selected from four different areas, which are reading and writing, math, language and communication, and fine/gross motor skills. Each goal-writing task included four different common core standards. Each participant was supposed to write a total of 12 goals for all applications. They received feedback based on the goals and objectives that they wrote.

Additionally, there was an IEP scoring table that included the five components of an IEP goal: student's name, behavior, criteria, condition, and functionality. The participants could see their total scores on the IEP goal writing as well as the scores for each component when they received feedback. The researchers evaluated the goals for each area of Common Cores based on the five components. In the table, each component score ranged between 0



to 4 points. If the participants included one of the components in the goal, they received 1 point for that component. If one of the components was not included or was written inaccurately, the participants received 0 points for that component of the goal. Since there were four different goals, the total points available from a single component equaled 4 points. The sum of each correctly written component indicating the total score equaled 20 points. Moreover, the table also involved a section for the researcher to provide an example goal for the participants regarding their mistakes and inaccuracies in the goals. This section enabled the participants to compare their incorrectly written goals with the correct ones (See Appendix).

#### INTERRATER RELIABILITY

The first author of this study scored all the participants' IEP goal writings for the pretest, posttest, and maintenance data. Then, to estimate the interrater reliability of the scoring, the data for the pretest, posttest, and maintenance was scored by the second researcher of this study. The interrater agreement score was calculated as the number of agreements divided by the total number of possible points and multiplied by 100. For pretest, posttest, and maintenance, the interrater agreement was found as 96%, 97%, and 95%, respectively. Based on the guidelines of Hartmann et al. (2004), the interrater agreement of this study was sufficient.

#### DESIGN AND DATA ANALYSIS

This study was a repeated measures design examining the differences in the participants' mean scores on the IEP goal writing within groups and between the two sections of the course over three points in time. First, based on the IEP scoring table, the scores of the participants on the first IEP goal writing were used as pretests. Second, they received the first verbal and written feedback, which was considered the first treatment phase. Third, the participants completed the second IEP goal writing, and their scores were used as posttests. Then, the instructor conducted the second treatment phase as the second set of verbal and written feedback on the second IEP goal-writing task was provided to the participants. Four weeks after the second treatment phase, the participants returned the third IEP goal writing, which was employed as the maintenance condition.

A two-factor analysis of variance (ANOVA) with repeated measures, comparing the two sections of the course and pretest-posttest-maintenance scores within groups, was completed for the dependent variables. In this case, the total score and the scores for each component of an IEP goal including behavior, criteria, condition, and functionality were used for the data analysis. The component, the student's name, was not a part of the analysis since all the participants included it in all of the IEP goals that they wrote. Additionally, effect sizes were calculated by using partial eta-squared for differences between each IEP component.

#### RESEARCH ETHICS

The researchers followed ethical guidelines while conducting the study and reporting the results. All participants were ensured of their safety and privacy. Also, they were reminded several times that it was voluntary to attend the study and that they were free to leave if they no longer wanted to participate. The researchers obtained IRB approval from the Sinop University Ethics Committee for Human Research, and no ethical concerns were declared regarding the study by the committee members.

### 3 | FINDINGS

The current study investigated the question of whether pre-service teachers in elementary education program improve their IEP goal writing skills by receiving interactive feedback. To examine whether there was a statistically significant mean difference between the participants' scores on their three distinct IEP goal writings, a two-factor ANOVA with repeated measures was conducted. Within-group factors included the total pretest-posttest-maintenance scores and the pretest-posttest-maintenance scores for each component of an IEP goal. The between-group factors involved the two sections of the course.

#### TESTS OF STATISTICAL ASSUMPTIONS

Prior to conducting a two-factor ANOVA with repeated measures, the following assumptions were tested to confirm that the data were suitable for data analysis. First, the assumption of normality was tested. Careful inspection of the skewness and kurtosis values showed that the assumption of normality was met. The skewness value of .281 and the kurtosis value of .555 are generally considered normal within the range of +/-2 (Lomax & Hahs-Vaughn, 2012). Second, the assumption of homogeneity of covariance was calculated. The results of the Box's M Test are not statistically significant for the total scores, and the scores for each component of an IEP goal indicated that the homogeneity of covariance was met as  $F(6, 36445.963) = 1.800$  for total score,  $p = .095$ ;  $F(6, 36445.963) = 1.792$ ,  $p = .096$  for behavior;  $F(6, 36445.963) = .896$ ,  $p = .497$  for condition;  $F(6, 36445.963) = 1.751$ ,  $p = .609$  for criterion; and  $F(6, 36445.963) = .768$ ,  $p = .695$  for functionality. Third, the assumption of sphericity was examined. The results of Mauchly's test indicated that the assumption of sphericity was met as  $X^2(2) = 1.161$ ,  $p = .560$  for total score,  $X^2(2) = 2.471$ ,  $p = .291$  for behavior,  $X^2(2) = .622$ ,  $p = .733$  for condition,  $X^2(2) = 1.304$ ,  $p = .521$  for criterion, and  $X^2(2) = 3.548$ ,  $p = .170$  for functionality. Last, the assumption of homogeneity of variance was tested at each time period (pretest, posttest, and maintenance). Levene's test suggested that the assumption of homogeneity of variance was met for total pretest-posttest-maintenance ( $p_{pre} = .070$ ,  $p_{post} = .529$ ,  $p_{maint} = .0480$ ), for behavior ( $p_{pre} = .830$ ,  $p_{post} = .064$ ,  $p_{maint} = .097$ ), for condition ( $p_{pre} = .484$ ,  $p_{post} = .394$ ,  $p_{maint} = .573$ ), for criterion ( $p_{pre} = .542$ ,  $p_{post} = .465$ ,  $p_{maint} = .049$ ), and for functionality ( $p_{pre} = .168$ ,  $p_{post} = .600$ ,  $p_{maint} = .547$ ).

### BETWEEN-GROUPS FACTORS

The results of a two-factor ANOVA with repeated measures indicated that there was no statistically significant difference between the participants' scores of the two sections of the course on IEP goal writing over time. Means and standard deviations of the pretest-posttest-maintenance conditions for each section of the course were provided in Table 2.

Table 2. Means and Standard Deviations of the Total Scores

	Group	M	SD
Pretest	A	12.33	2.255
	B	13.05	3.109
Posttest	A	16.00	2.255
	B	16.08	2.431
Maintenance	A	16.50	1.920
	B	17.35	1.338

Two groups did not change at different rates as,  $F(2, 142) = .898$ ,  $p = .409$  for total,  $F(2, 142) = 1.317$ ,  $p = .271$  for behavior,  $F(2, 142) = 2.783$ ,  $p = .065$  for condition,  $F(2, 142) = 1.229$ ,  $p = .296$  for criterion, and  $F(2, 142) = .129$ ,  $p = .879$  for functionality.

### WITHIN-GROUP FACTORS FOR TOTAL SCORES

There were significant differences between the means at each measurement time for total pretest-posttest-maintenance scores as  $F(2, 142) = 105.384$ ,  $p < .001$ . The effect size was found as  $\eta^2 = .597$ . The results indicated a very large effect size based on Cohen's guidelines (1988) as .01 = small effect, .06 = moderate effect, and .14 = large effect. Additionally, the pairwise comparison results for total pretest-posttest-maintenance indicated that there was a significant difference between pretest and posttest ( $p < .001$ ), posttest and maintenance ( $p = .011$ ), and pretest and maintenance ( $p < .001$ ).

### WITHIN-GROUP FACTORS FOR COMPONENTS

There were also significant differences between the means at each measurement time for condition, criterion, and functionality as  $F(2, 142) = 19.194$ ,  $p < .001$ ;  $F(2, 142) = 71.322$ ,  $p < .001$ , and  $F(2, 142) = 76.935$ ,  $p < .001$ , respectively. No significant difference was found between the means over time for behavior as  $F(2, 142) = 1.701$ ,  $p = .186$ . The effect sizes were found as  $\eta^2 = .213$  for condition,  $\eta^2 = .501$  for criterion, and  $\eta^2 = .520$  for

functionality. Based on the guidelines proposed by Cohen, the results suggested large effect sizes for each component.

Pairwise comparisons were examined for those that were found to have a statistically significant difference between the means for the three time periods. For condition, the means of pretest and posttest ( $p = .010$ ), posttest and maintenance ( $p = .009$ ), and pretest and maintenance ( $p < .001$ ) statistically significantly differed from each other. For criterion, there was a statistically significant difference between the means for pretest and posttest ( $p < .001$ ) and pretest and maintenance ( $p < .001$ ) while no statistically significant difference was found for the posttest and maintenance ( $p = .099$ ). Similar to criterion results, for functionality, pairwise comparisons showed a statistically significant difference between the means for pretest and posttest ( $p < .001$ ) and pretest and maintenance ( $p < .001$ ); in contrast, no statistically significant difference was found for posttest and maintenance ( $p = .223$ ). Mean differences between the posttest and pretest, maintenance and pretest, and maintenance and posttest are provided in Table 3 for the total score and the scores of each component.

Table 3. *Mean Differences for the Scores of Three Points in Time*

	MD			
	Condition	Criterion	Functionality	Total
Posttest - Pretest	.512	1.353	1.206	3.347
Maintenance – Pretest	1.002	1.655	1.412	4.232
Maintenance –Posttest	.490	.302	.206	.885

#### **4 | DISCUSSION & CONCLUSION (DISCUSSION AND CONCLUSION PARTS MAY BE SEPARATED WHEN NEEDED)**

As the number of students from diverse backgrounds has been growing in inclusive classrooms, the responsibility of elementary education teachers has increased to address the students' various needs (McHatton & McCray, 2007; Unluol Unal et al., 2022). Writing quality IEP goals and objectives plays an essential role to promote positive outcomes for students with special needs (Lignugaris-Kraft et al., 2001). Thus, both the pre-service and in-service teachers need to know how to write quality IEP goals and objectives to ensure the success of those students (Kamens, 2004; Rätty et al., 2018). To improve the teachers' goal writing skills, implementing the *feedback procedures* was considered since it is one of the useful practices that help individuals learn the subject matter (Agricola et al., 2020; Carless, 2006). Therefore, the purpose of this study was to examine the impact of interactive feedback procedures on pre-service teachers' IEP goal writing skills.

In Turkey, several studies indicated that the quality of the IEPs is poor (Rakap, 2015), teachers have limited knowledge about how to develop IEPs (Akarsu & Atbasi, 2021), and they think implementing IEPs in crowded classrooms is demanding (Tike-Bafra & Kargin, 2009). The current study suggested that interactive feedback is beneficial for pre-service teachers to improve their IEP goal writing skills and therefore using these procedures might address the issues related to the quality of the IEPs and lack of knowledge. The results of a two-factor analysis of variance with repeated measures indicated that the pre-service teachers' total scores on the IEP goal writing task statistically significantly increased from pretest to posttest, pretest to maintenance, and posttest to maintenance. According to the results, the interactive feedback procedure is effective for teacher candidates. Several factors might be the cause. First, the interactive feedback procedure used in this study allowed pre-service teachers to exchange information about their strengths and weaknesses in writing IEP goals and objectives. The interactive feedback procedures created opportunities for pre-service teachers to clarify the issues that they need to improve, talk through their questions, and discuss their interpretations of the IEP goals and objectives. Moreover, the interactive feedback procedure helped the instructor clarify the expectations on the IEP goal-writing task throughout in-class discussions. Second, employing visual presentations appeared to be an appropriate method (Bartsch & Cobern, 2003) for pre-service teachers to improve their goal writing performance. Additionally, the visual presentation includes common mistakes that pre-service teachers made when writing IEP goals. We also



provided students with examples and non-examples selected from the pre-service teachers' written goals after the researchers of this study gathered them from both pretest and posttest implementation. Thus, demonstrating the common mistakes and providing how to correct the inaccuracies in their written IEP goals might be another reason that helped the pre-service teachers improve their IEP goal writing skills. This finding is also consistent with the previous research studies indicating the effectiveness of two-way feedback on students' academic outcomes (Nicol, 2010). Furthermore, past studies also supported the idea of encouraging students and teachers to actively use the interactive feedback procedure to improve their performance (Laurillard, 2002). Third, small group discussions might have helped the pre-service teachers fortify their active learning and engagement (Yazedjian & Kolkhorst, 2010) when writing IEP goals and objectives. By constructing student-student interaction, the pre-service teachers were able to develop more collaborative dialogues (Blair & McGinty, 2013).

This study also examined the components of condition, behavior, criteria, and functionality to find out whether there was a statistically significant difference between the means at three points in time. The results for the *behavior* component were found to be not statistically significant for all implementations including pretest to posttest, pretest to maintenance, and post- to maintenance. This might be explained by the following reasons. The mean score for the behavior component in IEP goals of teacher candidates was 3.21 for pretest implementation. Considering that the highest score available was 4.00 for each component, it can be seen that their pretest scores were already in the expected range, which left little to no room for improvement. Teacher candidates seemed to have knowledge about how to employ measurable and observable verbs as well as address one behavior at a time. This knowledge might come from either the training that was provided at the beginning of the study or from taking the courses focusing on behavioral approaches in classroom management (i.e., Educational Psychology and Classroom Management; Ozyurek, 2005).

The findings indicated a statistically significant difference for the *condition* component for all scores including pretest to posttest, pretest to maintenance, and post- to maintenance. Additionally, the findings for *criteria* and *functionality* were statistically significant for the scores of pretest to posttest and pretest to maintenance while no significant difference was found for the posttest to maintenance score. However, even though it was not significant for posttest to maintenance, there was a mean difference between posttest to maintenance scores. For each component mentioned above, the data indicated an increase in the maintenance scores of the pre-service teachers even though it was gathered after four weeks of interactive feedback implementation. This result suggested the pre-service teachers improved their IEP writing skills with the support of the visual presentation handout, written feedback, and small group discussion used for the interactive feedback procedure for four weeks. The finding, the increase in the maintenance condition, is consistent with the previous research since the researchers found an improvement in the maintenance scores of the participants even though several weeks had passed after the training (Courey et al., 2012).

The results also indicated that there were no statistically significant differences between the pre-service teachers' mean scores of the two sections of the course on IEP goal writing at any of the three points in time. This finding was expected because the same researcher administered the interactive feedback procedure to both sections of the course by applying the procedures. This finding also indicated that the effectiveness of the interactive feedback procedure on pre-service teachers' IEP writing skills was consistent with the two sections of the course.

Last, the results also showed that the effect sizes at each measurement time for pretest-posttest-maintenance scores of the total and the components were large meaning that the magnitude of the difference of the scores at three time points was considerable. This finding indicates the practical importance of the research findings and suggests that the research results were generalizable to teaching IEP goal writing skills for pre-service teachers.

#### LIMITATIONS AND FUTURE RESEARCH

The results of this study should be interpreted within the context of three potential limitations. First, the IEP goals and objectives provided in this study were mainly based on the case scenarios developed by the researchers. Although the cases provided in this study were created based on the researchers' experiences from real-life environments, future researchers might replicate this study with real cases rather than hypothetical ones to have more rigorous research results. Second, the data were collected from pre-service teachers enrolled in elementary education program; therefore, the study is limited to teacher candidates from a similar population only. Future

researchers should conduct this study with in-service teachers to generalize the results to the teachers actively working in the field. Moreover, collecting data from in-service teachers might also enable future researchers to directly observe and evaluate the implementation of IEPs as well as the development process. Additionally, there was no control group to compare the scores of the participants who received the interactive feedback procedure. A confounding factor might be the reason for the improvement of the participants' IEP writing skills rather than originating from the interactive feedback procedure.

#### IMPLICATIONS FOR PRACTITIONERS

The results of this study have several implications in the field of special education. First, teachers and educators need assistance when writing objectives that demonstrate specificity (Lynch & Beare, 1990). It was evident that the feedback procedures followed in this study can be used to assist pre-service teachers when writing high quality IEPs in their future classrooms. Furthermore, since implementing the IEPs packed with measurable, observable, and functional goals is more likely to foster students' development (Pretti-Frontczak & Bricker, 2000), the interactive feedback process will help teachers and educators develop better goals and objectives which, in turn, will lead to more effective implementation of IEPs. Last, the assessment we used to evaluate the quality of IEP goals and objectives in this study might also be used as a self-assessment method by both pre-service and in-service teachers along with other professionals in the IEP team to evaluate their own ability to track their progress in IEP goal writing.

#### CONCLUSION

The purpose of this study was to enhance the teacher candidates' performance of writing IEP goals and objectives by using interactive feedback procedures. The results of this study suggest that pre-service teachers' IEP goals improved regarding the overall quality and the quality of each component during the implementation of interactive feedback. Since the IEP requires the involvement of teachers, policymakers, parents, and students with special needs, any attempt on improving the quality of an IEP will help all stakeholders and result in more positive outcomes for students with special needs. Although more research is still needed for the development and implementation of IEPs, this study will contribute to the field of special education by introducing effective procedures to improve the writing quality of IEP goals and objectives.

#### STATEMENTS OF PUBLICATION ETHICS

Research and publication ethics were observed carefully throughout the study. The researchers ensured the safety and privacy of all participants and followed ethical principles while conducting the study and reporting the findings. The IRB was approved by the Sinop University Ethics Committee of Human Research with the decision number 2020/80 on 23.06.2020.

#### RESEARCHERS' CONTRIBUTION RATE

The first author collected the data and conducted the data analysis. The second author scored the goals and objectives for data analysis. All three authors equally contributed to designing the research, reviewing the literature, and discussing the findings.

#### CONFLICT OF INTEREST

The authors declared no potential conflicts of interest.

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## APPENDIX

Mary is an 8-year-old student who is enrolled in second grade. Mary's mother is working as a nurse and her father is a government employee. When Mary was in first grade, you realized that Mary was above her peers and referred her for special education services. After a series of tests and observations, Mary was identified with giftedness and started receiving special education services. Therefore, an Individualized Educational Program should be developed for Mary.

Based on the observations and evaluations, Mary's reading, writing, and mathematical skills are at fourth grade level. She usually demonstrates leadership skills when she communicates with her peers. In her conversations with her friends, she enthusiastically shares what she learned from the documentaries. Mary spends her after-school hours in robotics lab. Her parents have been struggling with answering her questions and asks for your suggestions on the activities they could do with her from time to time. Mary's parents usually consult with you to plan her future career and increase her future life standards.

**INSTRUCTION:** You plan on doing some activities for Mary and therefore you select some of the topics from 4<sup>th</sup> grade curriculum. Please write appropriate IEP goals from the curriculum topics below.

**OBJECTIVES:**

1. Comparing the texts and evaluating them
- 

2. Using punctuation marks and capital letters accordingly
-

3. Solving problems that require additions with natural numbers

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4. Making prepared speeches

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Feedback Table

Components	Student's Name	Behavior	Condition	Criteria	Functionality	Total
Score						

Example	
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